Youthia™: A Distributed Mobile Commerce Network

Youthia Protocol

January 18, 2019

Abstract

The future of global trade and its patterns will be heavily influenced by dramatic age structures and technological change. This will also involve the change in the distribution of people, but also big changes in their relative age; that will further shape how goods and services flow around the world. Youth, are undoubtedly the most significant untapped natural resource and the mobile economic opportunities in emerging markets with this cohort are astronomical. In fact, demographic change will drive world trade, where there is local strength and global reach. This crucial demographic transition and the growth of the global economy can only be achieved primarily through investment in youth small-and-medium enterprises. With a global youth population of over 1.8 billion aged 18 – 36, youth entrepreneurs still face significant challenges when starting businesses such as access to markets, funding and better infrastructure. By dismantling monopolies, creating new demands and tackling old problems with new technology, youth entrepreneurs prove to foster more competitive economies and are enablers of shared prosperity, while adapting more rapidly to ever more globalized societies.

An underserved market this big cannot be ignored and frankly, **youth is big business.** Youthia aims to plug into this and become one of the chief pioneers. With global trade seeing very little innovation lately, it is believed that blockchain technology could speed up commerce, all while improving, rather than compromising, security. International trade demands a faster, more secure and efficient way to handle business processes needed to move goods across international borders. Inefficiencies of traditional commerce, business and financial infrastructure are limiting trade and economic growth. Industries where intermediaries serve traditional commerce face process optimization and scalability issues. Due to this, businesses often find it tedious to harness, the full potential of the talent and market. As a result, there is a vast pool of untapped talent potential, struggling businesses and growth on both ends at sloth speed. More importantly, **the two biggest systematic inefficiencies – access to markets and funding – are locking out hundreds of millions of potential significant key players in the (digital) economy – youth SMEs.** There is a possible solution for these systematic challenges: to move businesses to a blockchain and the need for trusted intermediaries whose externalities have weighed negatively on trade flows can be eliminated.

Interestingly, youth-driven decentralization is yet to be explored. The internet is in the middle of a revolution, driving towards decentralization with widespread utility of blockchain. Centralized proprietary services are being replaced with decentralized open ones, trusted parties replaced with verifiable computation, brittle location addresses replaced with resilient content addresses and inefficient monolithic services replaced with peer-to-peer algorithmic markets. Decentralized public ledgers process sophisticated smart contract applications and transact crypto-assets worth tens of billions of dollars. These systems are the first instances of Internetwide Open Services, where participants form a decentralized network providing useful services for pay, with no central management or trusted parties. The proliferation of decentralized markets replacing centralized online commerce allows for sellers and buyers to engage in direct trade, where centralized servers are being abandoned for employing participants' own mobile devices and computers as the underlying infrastructure.

This idea seems to be powerful, thus, there is a dire need to utilize the rising power of youth commerce and the willingness of youth entrepreneurs to work via such a blockchain network through verified 'Youth Hubs'. The result? Trustworthy talent on demand, employment and timely payment, standardized quality of work, fewer entry-process-exit barriers for businesses, significantly reduced and enhanced cost-profit graphs, maximum utilization of potential youth talent and faster growth for individuals and businesses. Youthia is such a network in the making, determined to skyrocket this idea. **Youthia is**

pioneering a new paradigm for economic participation called verifiable transactions or #VT, the most important hashtag on the mobile network. This paradigm will enable youth hubs, buyers and financiers to break down resource and market barriers by engaging on the premise of #VT, and not traditional criteria that has been locking out hundreds of millions of potential key economic players. With #VT, we are able to unlock significant economic growth in measures we have never seen before in human history. Built on a secure, public permissioned blockchain hybrid, Youthia is **a global mobile commerce network** with two tiers. The first tier is an algorithmic market between youth hubs and individual or corporate buyers. The second tier offers financiers our customized Software Development Kit, Universe, to build and deploy decentralized tools that represent funding, to accelerate commerce on the first tier. To the *Yth* degree, the Youthia network offers the opportunity to drive the economy of the *future*, distributed.

This work:

(a) Formalizes decentralized youth commerce and then constructs Youthia as a #VT protocol.

(b) Introduces a secure, public permissioned blockchain hybrid with an emphasis on data privacy.

(c) Introduces an open chain centered on the youth hub, provides an overview of the protocol and several components.

(d) Outlines the differentiation of a protocol network optimized and run on mobile devices such as mobile phones and tablets.

(e) Explains the role of the *Yth* native token that powers commerce by youth hubs.

(f) Introduces a novel algorithm of Verifiable Markets and constructs two markets, a Selling Market and a Buying Market, which govern how youth commerce is verified.

(g) Introduces the role of financiers in the Seller-Buyer dynamic.

(h) Discusses use cases of the protocol network.

Please Note: Youthia is a work in progress. Active research is under way and new versions of this Whitepaper will appear at https://youthia.co. We invite engagement on our protocol network and for comments and suggestions, please contact us at info@youthia.co.

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1 Introduction

The Youthia project was kicked off in October 2014 at Microsoft in Nairobi (Kenya) as part of a three-month internship initiated by former President Barack Obama's flagship program, the Mandela Washington Fellowship. The Founder, Mandy Shemuvalula, and a supporting team, in and outside Microsoft, with a vast and varied academic and industry experience in international business, finance, strategy, computer science and SME development across Africa and the world, developed and tested the project within the local business community in Nairobi. Prior to Microsoft, the Founder participated in another internship at the World Headquarters of Coca-Cola in Atlanta (United States of America) and subsequently, traveled across five cities in India to observe Coca-Cola's distribution and supply chains.
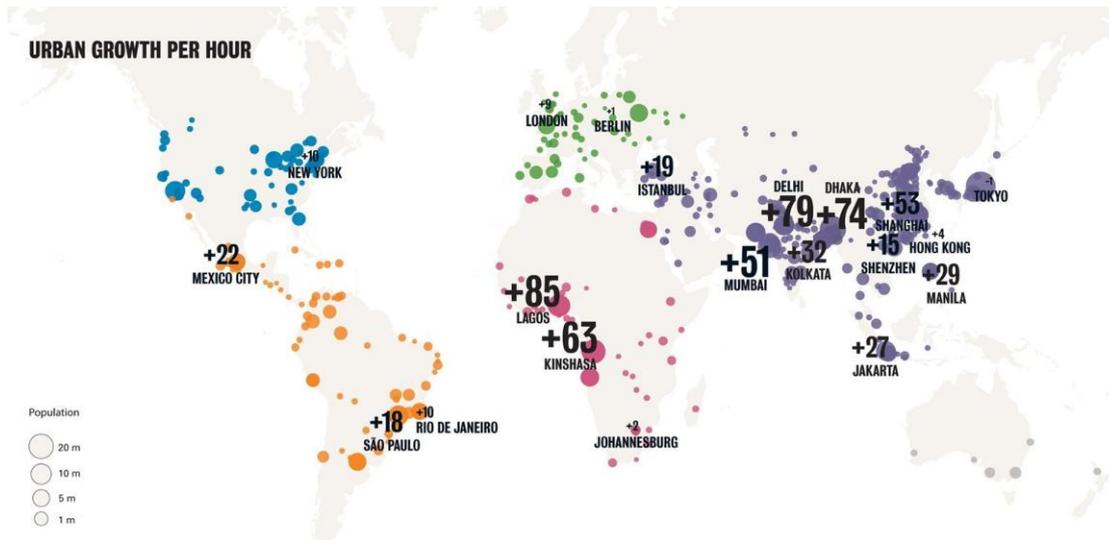
1.1 Why Youthia?

The *Yth* token holders are presented with the following unique and exponential opportunity:

1. Youthia has a Minimal Viable Ecosystem with an existing and fast-growing network of youth entrepreneurs. Thus, the market for Youthia already exists, standing currently at over 2200 early adopters and is growing on average by 5% per week. Youth entrepreneurs are defined as aged 18 – 36 years old and running small to medium enterprises in emerging markets around the world.
2. Youthia plans to monetize on the protocol layer within the network. The goal is to deliver a high quality, valuable but simple digital product.
3. Youthia will focus on the aggregation construct for building a network of engaged users who are incentivized to drive massive network ownership effects.
4. Youthia has a first-mover advantage of providing an urgent product to an emerging and expanding market.
5. Youthia is prioritizing building a strong and dedicated global developer community to enable developers to create tools for specific business and industry use cases.
6. Youthia is currently in talks to build value-adding partnerships with several major blockchain and non-blockchain players, Internet Service Providers, financiers, stakeholders, telecommunication companies, etc.

Lastly, Youthia was officially endorsed as a 'disruptor' at its Media Launch at Hilton Hotel in Windhoek (Namibia) on September 27, 2017, by the then Minister of Sports, Youth and National Service, Honourable Jerry Ekandjo, through a Keynote Address. Media stakeholders, private sector leaders and high-level public officials attended.

1.2 The Opportunity

The digital life expectancy for youth is proliferating and is estimated that by 2020, the digital economy will account for over 26% of global Gross Domestic Product (GDP). This presents a tremendous opportunity to be part of the new digital world order. Youthia's mission for its target market, youth entrepreneurs, is to use blockchain to bring youth commerce into the digital era, and lower resource and market barriers. Youthia aims to be the backbone of youth commerce and is committed to excellence in youth economics to help convert the youth bulge into a youth dividend.

URBAN GROWTH PER HOUR

+9 LONDON
-1 BERLIN
+19 ISTANBUL
+10 NEW YORK
+22 MEXICO CITY
+85 LAGOS
+63 KINSHASA
+18 SÃO PAULO
+10 RIO DE JANEIRO
+2 JOHANNESBURG
+79 DELHI
+74 DHAKA
+53 SHANGHAI
+51 MUMBAI
+32 KOLKATA
+15 SHENZHEN
+4 HONG KONG
+29 MANILA
+27 JAKARTA
TOKYO

Population
20 m
10 m
5 m
1 m

The World's Fastest Growing Cities

1.3 Youth Commerce Overview: Reframing Youth as a New Asset Class

There are three interdependent 'pillars' required for economic and job growth:
  (a) The first is policy reform and a commitment to the rule of law.
  (b) The second is investment in infrastructure.
  (c) Lastly, prioritizing the development of manufacturing and processing industries.

These three pillars reinforce each other and help to unleash the private sector while increasing both local and foreign investment. The significant political and economic changes that are happening today, like the backlash against globalization, anxiety over lost jobs, political upheavals and deepening inequality, reinforce the urgency around thinking capitalism as historically practiced. As homegrown businesses meet social and economic needs by creating products and services with an innate understanding of the local environment, they can bring private capital to vital infrastructure like road transport and power generation. The question remains how. The answer is by democratizing access to opportunity with an emphasis on tapping into the talent of human capital, it is imperative to 'institutionalize' luck, which is a key factor in the success of any entrepreneur. To cater to this, entrepreneurs and those they inspire are on Youthia's radar because they are the lifeblood of significant economic growth. Entrepreneurs are playing a crucial role in bringing together private wealth and public need. They will prove a fundamental tenet: that it is both necessary and possible for entrepreneurs and society to prosper simultaneously. The transformative impact of economic growth unleashed by a fully empowered, socially conscious entrepreneurial class will dwarf the results achieved by the previous aid-driven approach to development. In addition, they can create quality jobs, which will drive the creation of a thriving middle class, which form a new generation of consumers or buyers.

As a new asset class, the youth are full of innovative ideas that seek to address a variety of societal challenges. As investors look to diversify their portfolios, they may increasingly look to the youth for high growth opportunities. This is not to say that the youth are assets that can be hedged and traded. However, to argue that the enterprise of youth needs to be considered as both viable and valuable investments, perhaps even as a new asset class. With many investments captured within traditional investment classes, such as debt, equity and venture capital, youth and other emerging markets present a tremendous market opportunity.

As new asset classes have come into play over the last decades, leaders in the global financial sector have argued that as asset class is no longer defined merely by the nature of its underlying assets. This includes impact investments, social bonds, etc. But rather by how mainstream investment institutions organize themselves around it makes the difference. As more investors see the value of investing in the future and positioning themselves to yield subsequent dividends, youth may become an asset class in itself. It is often quoted by Global Impact Investment Network that the identifying characteristics of an asset class in today's markets requires a unique set of investment and risk management skills. It also demands organizational structures to accommodate this skillset, is serviced be industry organizations, associations,

education and encourages the evolution of standardized benchmarks and/or ratings. With adequate development, youth investments have the potential to meet or exceed these criteria.

The most pressing question is whether the youthful population is a risk or an opportunity. To answer this, the youth will be the driving force behind economic prosperity in future decades, but only if mechanisms are in place to enhance their chances. Mostly, we need to outline the opportunities and risks that can result from the large numbers of youth. Many developing countries have youth populations because of recent decades of high fertility (births per woman) along with improvements in child survival. A drop in fertility can change a country's age structure and can profoundly affect the economy. A large workforce with fewer children to support creates a window of opportunity to save money on health care and other services thereby improving:

(d) The quality of education,
(e) Increased economic output.
(f) More investment in technology and skills to strengthen the economy.
(g) The wealth needed to cope with the future aging of the population.

Some economists call this window of opportunity the 'demographic dividend'. For countries to maximize and reap their demographic dividends, they must ensure their young working-age populations are equipped to seize opportunities for jobs and other income-earning possibilities. With the right investments in human capital, countries can empower young people to drive economic and social development and boost per-capita incomes. The demographic dividends is broader and more varied. It is not merely about money, savings and the economic growth. As youth move into working adulthood with fewer dependents to care for, they will have more opportunity to acquire wealth, savings and purchasing power and accelerate economic growth. Increasingly, countries recognize the demographic dividend as a critical pathway to achieve rapid and inclusive economic growth required for long-term development.

THE ROLE OF SMEs

95%
of enterprises across the world

Economic empowerment

Employment

Income distribution

$23Trillion
of goods and services traded in 2014

70%
of employment in the world

Export revenues

Poverty reduction

Business opportunities

SMEs are the missing link for inclusive growth

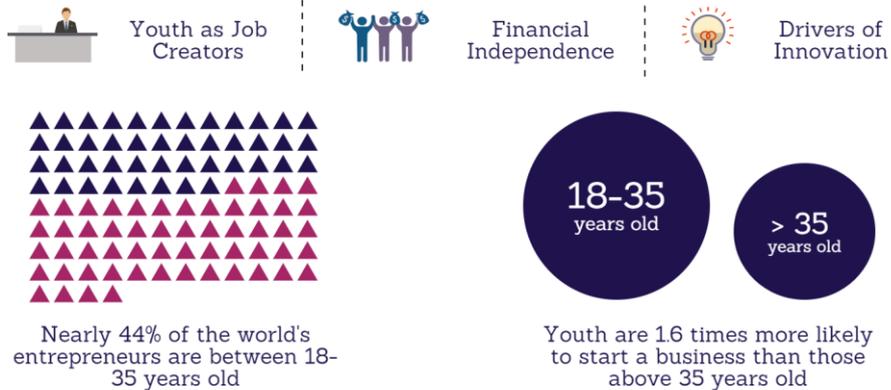Source: ITC SME Competitiveness Outlook 2015

ITC

The Role of SMEs

2 The Problem

Despite years of progress, youth continue to be unemployed and underemployed. They account for a whopping 60 percent of all the unemployed. The global average of the unemployment rate is 5 percent. This rate may not seem high but the crucial problem is that the youth unemployment occurs at a rate more than twice than that for adults. As a new asset class, the youth are the main catalyst for the explosive growth of the web, digital and mobile technology. The global mobile market is significantly growing due to the rapid demographic change, promising GDP and increased mobile technology usage. As the biggest adopters of new technology, the youth are increasingly driving digital commerce due to low barriers of entry. With several millions of youth entering the job markets each year, vastly outnumbering the jobs available in both public and private sectors, many of these youth have turned to entrepreneurship.

YOUTH ENTREPRENEURSHIP

Youth Entrepreneurship Statistics

However, without an established credit history, significant assets or business experience required by traditional investment models, youth entrepreneurs are the most disadvantaged and are underserved and constrained by access to affordable and flexible capital, markets, skills and human resources to start or expand a business. This gap for youth businesses is incredibly worrisome as cited by the World Bank, as SMEs contribute up to 40% of GDP in developing markets. The vast majority of commerce and trade still relies on traditionally architected business and financial products and services, and outdated criteria to access them. These systems account for value in centrally managed databases. These custodians and their services are subject to censorship, seizure, failure, hacking rick, monopolistic pricing and other externalities. Disadvantages that SME face include high barriers to entry and low insulation from conditions that would barely scratch their larger peers. The current regulatory environment is purpose-built for companies that are several magnitudes larger and makes it hard to find financing, scale operations, process payments and recruit other ancillary services that are both necessary and yet monopolize the time and resources of small businesses.

Bottlenecks Affecting Youth SMEs

Large corporations and banks offer new categories of existing products and services, but maintain the same criteria to access them. This is how innovation in this space has evolved. With high market and resource barriers to stimulate business creation and growth, youth entrepreneurs are a mismatch. Interestingly, there is a significant amount of talent and activity by youth businesses that is locked out of mainstream structures and these structures happen to be fragile and not adaptive. In addition, the complexity and lack of trust and transparency to eliminate information asymmetry problems in addition to the difficult to align incentives among different parties. SMEs, buyers, financiers and stakeholders are

independent decision makers attempting to maximize profits in the face of asymmetric cost structures and uncertainties. Such profit maximizations often lead to poor performance of the entire business process.

3 The Solution

Youthia is a protocol network of a set of algorithms to power youth commerce verified on a secure, public permissioned blockchain hybrid infrastructure. Backed by the *Yth* native token and optimized for mobile devices, Youthia is bringing visibility and youth commerce solutions through smart contracts. The mobile youth hubs generate commerce that is captured, aggregated, organized and then directed into verifiable markets. Youthia employs a consensus verifiable market protocol centered on the youth hub and quadratic voting based governance to provide practical, finite time security guarantees. From access to markets and funding as variables required to grow in business; our protocol network utilizes smart contracts to optimize youth commerce based on verifiable transactions or #VT.

The Youthia protocol's core building block – the youth hub – restructures how youth entrepreneurs participate in the market. A hub is an area of economic activity at every level of the value chain. From farmer, artisan, inventor, producer, supplier, retailer, reseller to service provider, each hub creates a block in a chain to aggregate and organize youth commerce into verifiable markets. The protocol provides a service via a network of independent mobile youth hubs that does not rely on a single coordinator. The verifiable market algorithm operates the Youthia network, which clearly outlines the Seller-Buyer interaction to guarantee that youth hubs have correctly executed the fulfillment and delivery of products and services to buyers. This creates a powerful incentive for youth hubs to amass as many products and services as they can and sell them to buyers. The smart contract-based network enables the production, exchange, demand, offer and consumption of products and services to be publicly verified. The protocol weaves these amassed resources into a self-healing, self-sustaining and self-thriving mobile network that anybody in the world can rely on.

Through Multi-Hub Smart Contracting, the open network enables youth hubs to connect, transact, share information and responsibilities and serve buyers more efficiently and securely through our mobile chain infrastructure. Youth hubs can eliminate traditional business barriers and integrate small to big participants into an efficient, transparent and global network.

4 Youthia Architecture

Youthia is a mobile network with two different but simultaneous tiers.

4.1 Two-Tier Network

The architecture network is structured as follows:

(a) The first tier is a peer-to-peer algorithmic market where youth hubs transact with individual or corporate buyers by submitting sell orders, and buyers submit their buy orders. Orders are matched and settled.

(b) The second tier exists because of the first tier. On the second tier, the network provides access to our customized SDK, Universe, where financiers can build and quickly deploy distributed funding template-based (for beginner developers) or customized (advanced developers) dTools to power commerce on the first tier. Through the aggregation construct, Youthia affords financiers a unique network where they can provide funding on top of the protocol layer.

4.2 Multi-Hub Smart Contracting

The first and principle game theory we plan to develop is the Multi-Hub Smart Contraction (MHSC) application. The application will be designed in such a way that youth hubs connect to the Youthia network by launching a Hub Node to either serve on the first or second tier. Users can earn YTH tokens simply on both tiers as well as by becoming a Youthia Node and each hub that joins the network connects to other hubs to collaborate, build cross-border supply chains and achieve new economies of scale. This allows localities and regions to create real value in local economies by matching unmet needs with underutilized resources.

(a) These economies of scale help hubs become more competitive by sharing specialized skills, resources, personnel and talent.

(b) Simultaneously, this spreads the risk.

(c) The entire process forms larger hubs to serve the rising buyer with 24/7/365 open trade.

The MHSC supports the consensus of the protocol by ensuring that each hub cannot improve their profit margins by deciding to deviate from optimum decisions. Therefore, there is no incentive for the buyer (who launch a Buyer Node), financier (who launch a Financier Node) to vary from the set of actions that will achieve the optimal network solution. The implementation is executed by the consensus of the network in a standard, automated and audible manner. From the hub node's perspective, after making the initial input and setting up the Sell-Buy rules, they can receive the result where the network automatically executes an optimization threshold. This is ensured through coordination until Nash Equilibrium is reached and each hub's incentive is aligned.

4.3 Use Cases

The Youthia network may be used for a myriad of use cases and functions. The mobile chain technology will be incredibly simply, powerful, adaptive and responsive to the incoming data coming from the network. Youthia can be used for (but not limited to):

(a) Construct specific business contracts.

(b) Manage time-bound trade flows.

(c) Content and data marketing, combining flexible interfaces with an API-first/COPE (Create Once, Publish Everywhere) paradigm.

(d) Product and service distribution, across multiple contexts at lower costs and decentralize products and services by bringing performance benefits.

(e) Decentralize products and services.

(f) Single customer view for optimal relationship management in products and services.

(g) Flexible API-first commerce management of smarter, targeted commerce. Facilitates better conversion through personalization and localization.

(h) User experience. Track user activity and make real-time decisions about user commercial opportunities.

(i) Big data capability by an umbrella for user data across multiple economic touchpoints, bringing more power to the network.

(j) 24/7/365 'always-on' sleepless economy.

4.3.1 Examples of Real World Application

(a) **Youth Hub:** For instance, a youth entrepreneur based in Beijing (China), running an agricultural retail shop seeks to increase the digital footprint for his business. Software development talent is scarce and/or expensive. He connects to the Youthia network by launching a Hub Node and begins to deploy his sell orders onto the decentralized market. In addition, he can access growth funding by browsing dTools deployed by financiers and qualify based on the #VT he is generating from his hub.

(b) **Financier:** For example, a financier in Geneva (Switzerland) aims to start financing youth in business but does not know where to find verified investment opportunities. They have a newly launched funding instrument and want to test it out to a small private group of youth entrepreneurs before making it available to the public. They launch a Financier Node on the Youthia network and they hire a developer to build an advanced funding dTool using Universe and deploy it privately to the select private group. They indicate that the funding instrument is only available to Hubs who generate #VT: 1000 per/week (at least 1000 YTH worth of verifiable transactions a week). Once testing is complete, they can make it public to the decentralized market.

5   Network Architecture Overview
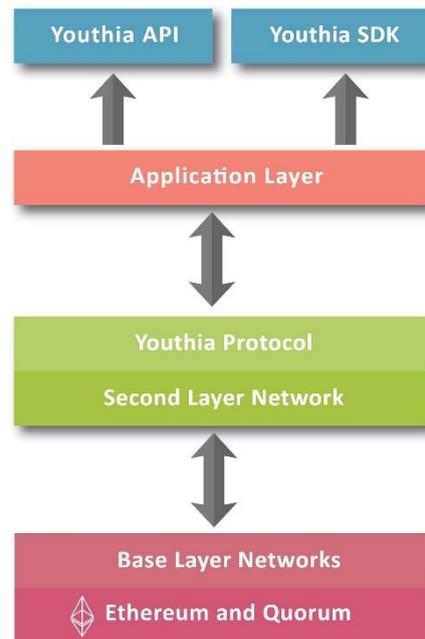
Network Architecture Overview

6   Network Mechanism

6.1 Tier 1 and 2

PUBLIC - Youth entrepreneurs launch a Hub Node on the public network and submit their sell orders to the market and buyers submit their buy orders. Buyers can be either individual end-users or corporate customers that buy in bulk. The network matches the orders.

PRIVATE – The two matched orders proceed to communicate in a private channel to support privacy, share cryptographic keys and other data before finalizing the transaction.

Tier 2: Financiers download and install Universe and can build and deploy customized funding dTools on offer to youth hubs.

6.2 Mobile Client-Server Distributed Interaction

- Youth hubs connect to the Youthia network by launching a Hub Node via their mobile device to start submitting sell orders.
- Each mobile client, called Youthia, comes preloaded with the ability to send or receive encrypted messages, YTH tokens, smart contracts, Universe, Data Cloud and the server.
- Combination of a secure mobile client and the Youthia transactions, messaging and browser features make for a fully decentralized solution for users.
- The critical elements for nodes will add, modify, validate and fix transactions.
- On start-up, the mobile client application needs a connection request to the server. The server sends back an acknowledgement message.
- The mobile client then needs to 'catch up' with the rest of the nodes. The current state of the network is downloaded from the server and initialized in a blockchain class object.
- The server handles each node on a separate thread.
- The mobile client keeps a very light copy and refreshes every seven minutes. A background thread handles communication with the server while waiting to read the next line in the socket's input-stream.
- It then performs the appropriate action. Adding a transaction involves sending a message, in JSON, to the server, which is broadcasted to all other nodes.

- The server adds it to its mobile chain as well. Each node maintains, calculates and updates new entries into the network.
- All nodes work together to ensure they are all coming to the same conclusions, providing in-built security and robustness for the network.
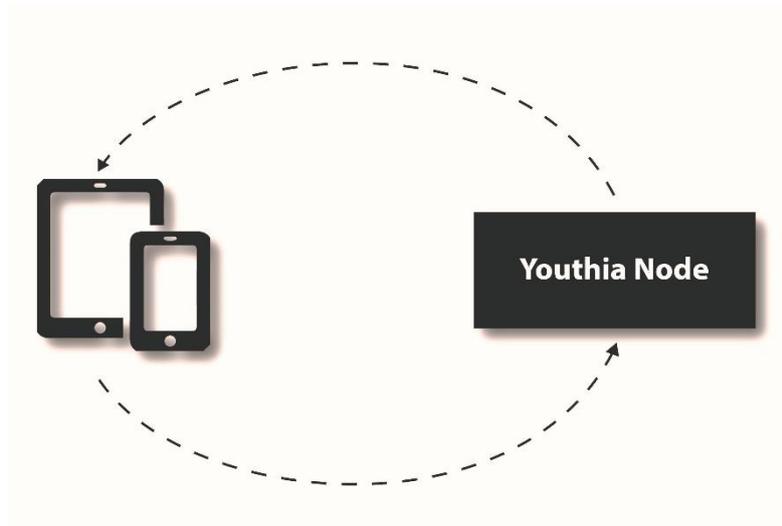
Youthia Node Network

6.3 Universe SDK for Distributed Tools Development on Tier 2

Youthia will offer beginner and advanced developers our SDK, Universe, to enable access to Youthia's network features and functionalities. This in turn offers the sharing of digital resources and services between users.

- Universe enables faster and more secure development of distributed tools for the blockchain generation to address the unique target market.
- This will be based on our network's capabilities and functionalities. We will take advantage of a seamless and secure peer-to-peer resource sharing and payment system by means of YTH tokens.
- Youthia will implement and make available all the building blocks of decentralization such as Gossip Protocol, Decentralized Database (with a light copy running on compatible mobile devices at all time), Quadratic Voting Mechanism and Oracle API.
- Using Universe, developers can earn YTH for software and services they provide on behalf of financiers and stakeholders.

6.4 Verifiable Market Transaction Rules

The Seller Market (youth hubs) and the Buyer Market have the same structure but different design.

- Sellers and buyers can set their offer and demand prices or accept current offers.
- The network runs the exchanges.
- The system guarantees that when buyers receive products and services reward sellers.
- The consensus algorithm of Verifiable Markets models transaction requests as orders.
- Verifiable markets ensure that payments are performed when a product or service has been correctly provided.
- More specifically, a seller submits a sell order or the buyer submits a buy order to the order book. When two orders match, the seller or buyer jointly create a deal order that commits the two users to the exchange and propagates it to the network by adding it to the order book.
- The system ensures that the product or service has been executed correctly by requiring the seller to generate cryptographic proof for the exchange.
- Upon success, the nodes process the payment and transaction settles, incentives are distributed to the network and buyer receives their order.
- The order is declared complete from the order book.

- The data can be tracked in users' profiles including transaction history, product or service information on prices, location, price increases and decreases, demand and supply over different periods, etc.

Youthia Verifiable Market Protocol

Order Matching:
Sellers add sell orders, and buyers add buy orders to the order book.
When two orders match, involved users jointly create a deal order that commits them to the exchange and propagates it to the network by adding it to the order book.

Settlement:
The network ensures that the transfer of products or services has been correctly executed, by requiring sellers to generate cryptographic proof for their exchange or service.

On success, the network processes the payments and clears the orders from the order book.

6.5 Public-Private Channel Coordination

All orders submitted to the network are public. Then, each communication channel becomes private where only the involved matched users maintain data privacy of cryptographic keys and transaction information. The network runs automatically based on pre-set inputs and only updates state of each transaction cycle for involved users.

7 Value for Users

We have several stakeholders who may seek to engage on our network. Our principle stakeholder is the youth hub and buyer, and our secondary stakeholders include financiers, telecommunication companies, Internet Service Providers, etc.

7.1 Youth Hubs or Sellers

- **Operational Efficiency:**
  By digitizing and standardizing the contracting and trading processes seamlessly, hubs can save on startup or overhead costs of processing paperwork, understanding different terms and going through multiple levels of manual review to make final business decisions.

  With more information about the trade, the hub can accurately set the rating and risk factors. Increased levels of manual review to make final business decisions.

- **Business Optimization:**
  The Youthia network assists hubs to achieve optimal optimization, without the need for unbiased decision makers and allowing them to share the business risk and the potential benefit.

- **Business Provenance:**
  Using smart contracts and token system, Youthia can expand Seller-Buyer-Stakeholder model and help hubs have visibility over the business process by interacting with different parties.

- **Process Automation:**
  Youthia helps to automate the transaction and contracting process through private communication channels.

  Both hubs and buyers can save time and be able to maintain an audit of the final agreed upon contract in real- time through Youthia's secured protocol and trustless network.

- **Low Costs:**
  With blockchain's ability to achieve remote, autonomous consensus between users, businesses have quickly figured out that such self-reliant data infrastructure is useful. It can help bring

products and services to market quickly and inexpensively, while offloading the traditionally high costs of doing business.

- **Levelling the Playing Field:**
  Youthia's network not only helps reduce costs but also allows hubs of all sizes to compete on a more level played field.

  Small businesses often work solely on scaling, but this focus neglects and strains the fundamental processes of invoicing, inventory and payroll that were established at the outset. Smart contracts are a more economical option that can help hubs inexpensively streamline the flows that keep them in business. They use the network to create, check and enforce contracts between buyers and stakeholders.

- **Privacy:**
  Hubs may want protection that is more comprehensive and may not have the capital to buy expensive, centralized server architecture or paying hefty fees to third-party web hosting services. Hubs can run on the Youthia network with total data privacy.

7.2 Buyers

- **Transparency:**
  Given the lack of transparency of transaction processes, sellers suffer from lack of trust from buyers. The Youthia network enables buyers to build better relationships with hubs through standardized smart contracts and follow an audit trail for each transaction, enabling repeat business.

- **Cost Savings:**
  Because of direct peer-to-peer trade, the costs that sellers can bypass due to the standardization of blockchain smart contracts can benefit buyers in the final prices they pay for products and services.

7.3 Financiers

- **Risk Mitigation:**
  We enable dynamic, real-time monitoring of financing processes to provide visibility into the business operations. Financiers can now better understand the actions taken by buyers.

- **Operational Efficiency:**
  With more information about the trade, the financier could more accurately set the rating and risk factors. Increased transparency over trade transactions tends to lower the risk factor and thus risk equivalent, which improves efficiency in operation and management of the funding provided.

- **Investment Opportunity:**
  Financiers can be any investor who is capable of assessing and taking the lending risk of the hubs. Youthia helps to lower the barrier to entry for financiers and allow investors to look for investment opportunities quickly and in a verifiable, vetting manner.

8 Ecosystem

8.1 Minimal Viable Ecosystem

Youthia aims to streamline complicated and time-consuming multi-user transactions in youth commerce by using the mobile chain to solve information asymmetry problems. The Minimal Viable Ecosystem (MVE) and strategic partnerships with stakeholders are crucial to onboarding new users and solutions to the network. MVE can be defined as the smallest configuration of elements that can be brought together and still create unique commercial value. MVE will be the main driver of massive ownership effects on Tier 1 level through the aggregation construct, whereas users can benefit from the utility of the network and as more users join, the network will increase in efficiency and utility.

On Tier 2, combining a mobile chain hybrid solution and Universe on the protocol layer is necessary to bring enough users to bear for a healthy minimum viable network. Eventually, financiers will be able to develop dTools on our network and either keep them private to a small group or make them immediately and publicly available to other users on the network. They will include the minimum amount of #VT youth hubs need to meet to qualify for specific funding dTools.

In order for the Youthia network to work, the mobile devices running must validate and agree that a transaction was completed. This is accomplished by agreeing on a sequence of 'blocks', with each one containing a set of transactions. Youthia draws the distinction between nodes capable of proposing and validating blocks.

8.2 Blockchain Value Addition to the Ecosystem

Technical challenges with blockchain technology have kept corporate parties at bay. Further research and development for the full potential of this technology to be realized are required on the Ethereum, Bitcoin and other main nets. These are:

- **Scalability:** All users on the network must execute all smart contract code.
- **Privacy:** All information on a public blockchain is visible to all users to read.
- **Confidentiality:** The network secures private transactions.
- **Performance:** Performance increases to handle the load that complex private transactions take place on the network.
- **Consensus:** Permissioned consensus and governance rules to drive new economic incentives at the protocol layer.

9 Ethereum and Quorum Hybrid

Faced with the choice of waiting for Ethereum to end the Ice Age and release Casper in the coming years, or building on recently produced viable solutions in this area, we have chosen to leapfrog the Ethereum roadmap by leveraging Quorum. It is an enterprise-focused version of Ethereum released by JP Morgan. Quorum allows us to leverage Constellation and a minimal Ethereum client fork to offer:

9.1 Quorum and Evolution alongside Ethereum

Because it is only minimally modifying Ethereum's core, we can incorporate the majority of Ethereum updates quickly and seamlessly. At the lowest level, we are modifying how the Ethereum client protocol enables consensus and permissions the blockchain. Our blockchain distinguishes between users that can validate blocks and participants that can propose blocks. The latter allows us to both secure private transactions on the network and incentivize developers to participate in the evolution of our network.
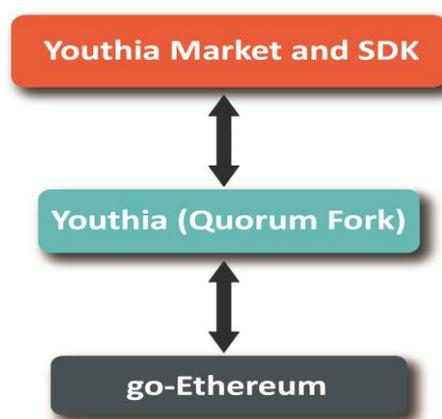
Interdependency of the Three Aspects

9.2 Consensus

Rather than proof-of-work (mining), Youthia uses a vote-based consensus algorithm that forks Quorum to add a few governance rules. Implementation details can be found at https://github.com/jpmorganchase/quorum.

9.3 Settlement Finality

The recent development on Istanbul BFT (Byzantine Fault Tolerance), which will be incorporated into Quorum, ensures settlement finality. It speeds up settlement time to under 1 second from the current tens of seconds to tens of minutes.

10 Governance

- Youthia chose to use Quorum because it is an advanced blockchain technology that is enterprise-ready distributed ledger and smart contract platform. Quorum assists where current proof of work-based blockchains like Bitcoin and Ethereum are not ready for enterprise-grade solutions. We believe the incentives of developer pools, clients and stakeholders/corporates contributing value to the ecosystem must be aligned on the protocol level. This governance model can be applied to other public, permissioned blockchains that are looking to address similar issues. Quorum is an enterprise-focused version of Ethereum and is ideal for any application requiring high speed and high throughput processing or private transactions within an approved group of known users. Quorum addresses specific challenges to blockchain technology adoption within the financial industry and beyond. Quorum also supports both transaction-level privacy and network-wide transparency, customized to buy requirements.
- Youthia's proposed quadratic voting-based governance model allows for a series of checks and balances between nodes.
- We analyze how a voting system-based consensus model draws a clear line between safety and activity.
- The percent vote required for consensus trades security for speed. We examine the counterbalance of power between actors on the network, proposing a model that discourages collusion and analyses the robustness of the protocol to keep block proposers and validators in check under independent choice, coordinated choice, and a bribing adversary.
- We conclude by analyzing several failure modes of the system and subsequent recovery.

10.1 Voting Smart Contract

- Quorum Consensus Process Flow
- Quorum Consensus Block Creation
- Quorum Consensus BlockVoting

(a) **Maker Nodes:**
Maker Nodes are responsible for proposing blocks, and their addresses are registered in the BlockVoting contract. The initial set of Maker Nodes is pre-configured in the genesis block and will be comprised of our initial token holders, however, once the network is established, this will begin to change as described below.

Maker Nodes will have the responsibility of voting in a new Maker Node every governance cycle. Nodes can opt to become Maker Nodes if they are Know Your Customer approved, and voted in by an agreed threshold of existing Maker Nodes according to the Quadratic Voting Governance Mechanism.

(b) **Validator Nodes:**
Validator Nodes help to secure the network, and they are registered in the BlockVoting contract. They are responsible for voting to determine which block will be the canonical hash at a particular height. Like Maker Nodes, the initial set of Validator Nodes is pre-configured in the genesis block.

(c) Registered Voter Nodes:
Registered Voter Nodes tie real-world identities of nodes. All nodes (including Maker Nodes, Validator Nodes, and other network users) are required to register to vote to participate in network governance mechanism. Designated Voter Nodes will have the responsibility of voting out a Maker Node every governance cycle and may be voted in as Maker Nodes once the network is established.

10.2 Governance Analysis

Governance analysis is on the evolution of the protocol network in the face of dishonest (traitors) nodes and incentive driven collusion. Recent developments in permissioned distributed ledgers have created the need to design a consensus that allows for a fundamental change in the underlying incentive mechanism and users that underlie the consensus protocol of permissioned, public chains. The desired outcome is to keep a group of dishonest nodes from gaining control of the block proposal mechanism or forking the chain while bootstrapping a cohort of honest nodes with a stake to protect the network and punish potential traitors. In the face of an undefeatable adversary leading to mechanical failure, we analyze the time, collusion, and resources required for such an attack.

It is paramount to keep in mind that the real identities of these nodes will mainly represent corporate incentives in the business industry and development communities. Therefore, incentives of these stakeholders must be aligned at the protocol level. It follows that developers have a stake and duty to secure the infrastructure of their applications, buyers and the parties they rely on. Similarly, buyers have a stake in ensuring the improvement of the network and a stake in punishing traitors. The latter reflects the view that Maker Nodes should represent developer pools, motivating buyers and end-users to become Registered Voter Nodes to participate in governance. While attacks on the network yield several failure cases, the confidentiality of private data stored on the blockchain is preserved. That is to say, protocol or governance failure does not necessarily entail a breach of security to private data as long as private keys remain secure.

10.3 Adversary under Independent Choice

The consensus algorithm and governance is not fully open to any client issuing commands. Under independent choice, users have no incentive to deviate from the protocol, as the network would defeat their attack. Nodes cannot single-handedly confirm the proposed block at each canonical height. Maker Nodes who stray from the protocol would reveal their intentions to the system, placing themselves at risk of being voted off the Maker Node pool in the next governance cycle. Both Maker Nodes and Validator Nodes have a history of who voted them into the system, by a majority Maker Node vote, and by invitation respectively.

10.4 Adversary under Coordinated Choice

In the event that there is an undefeatable and coordinating racket of dishonest nodes who by a series of governance cycles gain control of a majority of block maker nodes that would allow them to control block proposal to deviate from the protocol. The consensus algorithm is not fully open to any client issuing commands; thereby taking control of block maker governance requires traitors to be voted into the block maker pool.

10.5 Undefeatable Bribing Adversary

In the event that there is an undefeatable bribing adversary who by a set of highly unlikely events, knows exactly which nodes will propose the next sequence of n blocks and the price required to bribe each one to propose a tampered block. All nodes will commit treason for a price; the undefeatable bribing adversary has resources k at his disposal, and is driven by profit incentive. We analyze the cost of such an attack, m, over a sequence of n blocks.

10.6 Governance Level Attack

A similar 'k-strategy' could be designed to control governance over 'n-vote' cycles at cost m to an undefeatable bribing adversary. The governance model is unique in that the nodes have the responsibility of periodically voting out Block Maker nodes counterbalanced by block maker nodes being able to

appoint a replacement. Governance level attacks are part of the protocol and built into the network to discourage majority collusion. Under similar assumptions as above, we expect Block Makers to appeal to registered voters to defend their status. A coalition that controls over tokens could vote out any Block Maker they chose, and it is expected to incentivize them to spin up registered voters in their control to defend their status the only way the protocol allows, that is by voting out another block maker not in their coalition, simultaneously improving security.

10.7 Governance Hardening

In the event of an initial token supply of X tokens, the case where an adversary owns X-1 tokens and is attempting to gain control of the governance mechanism. We examine the minimum cost of controlling a sequence of n governance cycles with length T of an undefeatable attack strategy. We analyze the expense and time required from an undefeatable adversary to maintain control of the network. Our governance model implements quadratic voting making the cost of each v votes for a governance decision cost v2 tokens, all tokens paid are redistributed equally among the voting pool.

To assure control of the first governance cycle, the adversary must place 2 votes at a cost $v[1]2 = 4$ tokens, controlling X- 5 of the token supply in the second cycle, to assure control of the next cycle, the adversary must place 6 votes at cost $v[2]2 = 36$ to beat the possible 5 votes against his governance decision; this can continue to scale this way until $v[k]$ where the marginal cost of k nodes voting against the adversary increases.

11 Counter Measures against Governance Adversaries

The premise of attack from a bribing adversary is a valid concern if we are to expect the value of the network to scale as the square of connected users (Metcalf's Law). Distributed concentrations of wealth and a smaller block size discourage bribing users to deviate from the protocol for profit incentive. The non-deterministic choice of block proposers using random timeouts limits the calculation of such a k-strategy by an undefeatable bribing adversary. The cost of the k-strategy to launch a governance or protocol level attack scales inversely to the percentage of validators required for block confirmation and number of nodes on the network. Our proposed governance model allows for a series of checks and balances between nodes.

12 Peacekeepers: Quadratic Voting on Mobile Chain

These are (k = safety factor *) initial token holders nodes launched initially as block makers to defend the network and are registered in the voting contract as part of the bootstrap mechanism. These nodes participate in the consensus but are forced to abstain at each governance cycle. They will be first to be voted off the block proposer pool to make room for new Maker nodes, allowing the network to become fully decentralized over time while ensuring the minimum attack period of an undefeatable adversary cannot be realized in the infancy of the network.

Quadratic Voting Nodes can make v votes for a governance decision by paying v2 tokens. From there it is just a majority vote. All funds raised are returned by giving back to each in the voting pool,1/(voting pool-1) of the funds paid by the voter. The theory is that if someone gains x from a decision being made, and each vote has a probability p of being pivotal, then they have the incentive to keep buying votes for as long as the price of the next vote is less than px.

Because the total cost of v votes is v2, and we know from calculus that the derivative of v2 is 2v, users will have the incentive to keep spending tokens until 2v > px; hence, they will spend v = px/2 tokens. You can see from this math that the number of tokens that a voter buys should be proportional to x, i.e., the amount that they gain from the decision being made. Hence, the number of votes that a voter makes should reflect the strength of their preference and not just which option they prefer.

13 Finite Attack Window

If undefeatable adversaries are unlikely in practice or that the protocol will defend the network indefinitely, instead we maintain practical guarantees that ensure network safety by attempting to bound the minimum attack period and cost of an undefeatable adversary. The only way to hedge against this is to provide a finite possible attack period in a similar time scale to the minimum attack period of an

undefeatable adversary. That way, the voting contract will suicide halt all further change of state in the network, triggering open-source resources on any remaining proprietary portions of our system.

14 Network Application

On Tier 2, Youthia is developing a smart contract Universe. The core layer of Universe allows beginner and advanced to build and deploy dTools from the essential components, accelerating development of future youth commerce solutions to power Tier 1. We seek to enable the implementation of business processes and systems accessible to developers. This will allow them to improve these solutions and build on top of our protocol network to continue to evolve with the needs of our target market.

Tools on the mobile chain will include the ability for instant and clear proof of order verification on the blockchain, provide users with an audit of the final agreed upon contract in each step of the process in real-time. Using Multi-Hub Smart Contracting allows users to benefit from the combination of public-private channels and configurable Multi-Hub transactions to serve buyers. Users can have visibility at each level of the process while still maintaining privacy on each transaction level.

15 Roadmap

- **Q4 2014:**

Research and Development of Proof of Concept at Microsoft.

- **Q1 2015:**

Technical Proof of Concept.

- **Q2 2016:**

Seed Funding from Development Bank of Namibia.
Nudge Mobile Application Development and Beta Testing.

- **Q2 2017:**

Nudge Mobile Application Pivot.

- **Q3 2017:**

Seed Funding from Bank Windhoek and Price Water House Coopers.
Media Launch and Official Endorsement by Ministry of Sports, Youth and National Service.

CURRENT STAGE:

- **Q1 2019:**

Token Generation Event.
Governance Hardening.
First Phase Sourcing and Onboarding.
Core Functional Protocol and Network on Tier 1.
Strategic Recruitments & Partnerships.
Tokens Trading on Bancor Network.
Finalize Business and Legal Systems.
Mainnet Launch.

- **Q2 2019:**

First Governance Cycle.
Marketing and Media Relations.

- **Q3 2019:**

Tier 2 Functional Development and Activation.
Exchange Listings.
Local Stakeholder Engagement and Finalization.
Large-Scale Network Testing.

- **Q4 2019:**
Release 2.0 Network.
First SDK Release.
Second Governance Cycle.

16 Team, Advisors and Partners

- **Team Members:**

Mandy Shemuvalula, Chief Executive Officer. B.A. Marketing and International Relations & Honours B.C. International Business. Former Head of Marketing at Namib Leisure Resorts in Namibia and the Delta Leisure Park in Nigeria. Former Founder of Gloca Investments & Best Business Idea of the Year by Global Business Labs. Inaugural Fellow of Mandela Washington Fellowship. Internship at World Headquarters of Coca-Cola and Microsoft. Guest at Presidential Summit with Barack & Michelle Obama. Member of Alamo Chamber of Commerce. Operational Experience in Strategy, Business Development in New Markets & Stakeholder Engagement.

Eric Stone, Chief Technical Officer. B.A. Biochemistry & Molecular Biology and M.A. Biotechnology. Founder & CTO of Coinpal, Free Bitcoin Wallet on the Web, iOS & Android. Former Founder & CTO of Telesocial, Social Telecommunications API. Former Founder & CTO of Kadoink, Social Networking-Focused Communications Platform. Former Founder & CTO of CRM ASP, CRM SaaS Platform and Cloud Service. Former Production Systems Lead at Toyota. Former Senior Systems Administrator VI at Wells Fargo Bank. Former CEO & Founder at Alphabit Media, E-Commerce and Software Development Shop and Application Provider. Former Build & Release Manager at The Princeton Review. Has Eight Registered Patents.

Sarthak Shrivastava, Chief Operations Officer. B.E. Mechanical Engineering. Former Team Lead of Blackbuck, India's Largest Trucking Platform. Experience in Development & Implementation of SOPs for Operational Processes in Trucking and Logistics & Administrative Framework in Kandla Cluster. Expertise in Formulation of Strategic Alliances, Cross-Departmental Synergy & Channel Partnership. Developer of Retention Policies. Former Co-Founder of Zeading. Skills in Acquisition of New Markets, Sales Funneling, Quality Assurance & Demo Market Testing.

Richard Kim, Chief Financial Officer. B.S. Business Management. Veteran in Retail Industry in Small Privately Held, PE Backed, Pre & Post IPO and Publicly Traded Multi-Billion Dollar Organizations. Former CFO of Guideboat, Lolli and Pops & Kmart Apparel (Sears Holdings). Instrumental in taking Restoration Hardware Public as Vice President of Finance. Operational Experience in Strategic, Financial Planning & Modelling Processes to Maximize Shareholder Value.

Kinga Pecak, Chief Partnership Officer. B.S. Finance & Accounting. Fund Operations Analyst & Financial Reporting for GEM Realty Advisors and Built Relationships with Prime Brokers. Former Senior Audit Associate at RSM LLP Leading Various Hedge Fund & Broker Dealer Audit Engagements and Partnerships.

Jacob Munden. Chief Marketing Officer. B.S. Marketing Analytics & Mass Media Communications. Former Marketing Manager at MISE Holdings. Experience in Marketing for Multi-Million Dollar Companies. Market Research at Treatmentcalls.com for Mobile Advertising.

Prakesh Muthukrishna. Chief Sales Officer. M.BA. in Management. Former Director of Business Development at Orissa Wicomm Sdn Bhd. Successfully Secured $20.5M Contract & Signing Main Frame Agreement with Leading Towerco in the Region. Securing Cross Border Project Funding of $2.2M Revolving Credit with a Leading Financial Institution. 75% ($15M) Invoiced & Revenue Recognized Against Contract. Opex & Capex Savings for Customer by Formulating Strategies to Improve Efficiencies Ranging from O&M Cost, Improving Fuel Cost Management, Enhancing Procurement Decisions, Contract Awards & Reconciling AC Energy Billing.

- **Advisors:**

Michael Creadon is the CEO of 4Rev, a Global Crypto Research Blog. Has a Wealth of Knowledge in Capital Markets. Served for two decades as CEO of Traditum, a Proprietary Trading firm based in

Chicago specializing in Interest Rates and Agricultural Commodities. Served on several Regulatory Committees and is widely quoted in the Media for his Market Views and Trading Industry Insights.

PB Stanton is an Attorney fluent in Cryptocurrency, Blockchain, and Securities and Banking Law Compliance. Trusted ICO Advisor. Expert in Project Ideation, Tokenomics, and Whitepaper Creation, to full Turn-Key ICO Launches. Experience for 25+ years in Asset Protection, Estate Planning, and Tax Planning.

Carl Gunell has a Masters in Economics from University of Stockholm. Entrepreneurial Executive with 25+ years in International Business and Technology with Experience in an Entry into New Markets, an Introduction of New Products and Services, Capturing Untapped Growth Opportunities. SVP & Co-Founder of Geoverse.

Dan Westin has a Masters in Electrical Engineering and Computer Science from the Chalmers University of Technology Gothenburg and an MBA from the University of Chicago. Executive Advisory and Corporate Development with 25+ years in Emerging Technologies, Trend Analysis, Data Analytics and Value Source Integration. Previous VP of Global Sales at Teleca and Senior at Motorola and Ericsson.

- **Partners & Technical Support:**

17 Token Sale

The *Yth* is the fuel for the Youthia network and is the native protocol token. It is used to pay network fees, send tokens, interact with the smart contracts, build, deploy or use a dTool, purchase products and services, validate state changes, execute governance and any network computation. It is our priority to deliver a near-zero marginal product and monetize through maximized utility scenarios. The payment is calculated and made in *Yth*. By building a self-sustaining ecosystem of different users that accept *Yth*, a new community of developers using Universe will be incentivized to improve upon and help maintain the network. Thus, *Yth* has a binding effect: financiers that build useful funding dTools using the *Yth* may increase its value, providing further incentive to improve the network.

17.1 Token and Consensus

The *Yth* token functions to keep the network incentivized to participate in consensus and governance. Our native token's primary use is to pay gas, a mechanism used to incentivize Block markers to process network transactions. All nodes registered to vote can be incentivized by participating in governance via quadratic voting. 1,700 YTH minimal required to participate in consensus mechanism, but nodes can be voted off the consensus mechanism irrespective of their holding via quadratic voting governance. MasterNode is expected to have 1,700 YTH collateral, a dedicated IP address, and be able to run 24 hours a day without a more than a one-hour connection loss. They claim 100% of the transaction fees in blocks they make.

17.2 Token Structure

Because YTH tokens are native to the mobile chain which will be integrated into the Youthia network and will only be available when deployment is made for commercial use (Mainnet Launch, expected in Q4 2018), Youthia plans to sell a digital token native to the Ethereum blockchain that will be a precursor to YTH tokens. YTH tokens will be ERC-20 compatible tokens distributed on the Ethereum blockchain according to a related ERC-20 smart contract. Shortly before Mainnet Launch, YTH tokens will be tradeable on the Bancor Network, in preparation for the Mainnet launch.

Total Supply of Tokens: 170,000,000
Symbol: YTH
Decimals: 7
Fundraising Target: Soft Cap – U$2M equivalent; Hard Cap – U$4M equivalent.

17.3 Token Distribution

The total supply of YTH tokens, 170,000,000, will be distributed as follows:

110,500,000 will be allocated for Users. *1-year vesting schedule and 2 years selling schedule will be applied.*

34,000,000 will be allocated for the Youthia Company and team. *4 years vesting schedule, 6 months cliff and strict performance gates.*

17,000,000 will be distributed to Ecosystem, Stakeholders and Development Partners.

5,100,000 is for Hedging/Reserve. Hedging Volatility.

3,400,000 is for Advisors. *2 years vesting schedule and 2 – 4 years selling schedule will be applied.*

17.4 Participation

YTH tokens will only be minted in the genesis block, associating them with the wallet addresses of the holders of YTH tokens. YTH tokens will only be minted while the contract is active.

The Private Sale is currently in process and will close on January 31, 2019 (00:01 CAT).

17.5 Use of Funds

Youthia intends to use the funds from the sale of YTH tokens at the Token Sale for the following primary purposes:

- **Network Development (43%):** This includes maintaining competitive salaries for top global talent, paying for software hosting, accelerated development of system integrations and acquisitions of hardware. The hardware and hosting will be offered to anchor buyers, and that will need stand-alone computers to manage their respective business processes.
- **Build Network Ecosystem (35%):** This includes an effort to onboard youth hubs or SMEs through incentivizing early stage users and on-going business development to onboard buyers and stakeholders. Youthia will reserve a portion of tokens for this purpose in a secured wallet to ensure fair distribution.
- **Operational Expenses (22%):** This includes necessary operational costs such as office space, legal fees of pursuing and obtaining required licenses, and security measures.

However, Youthia may in its discretion use those funds for any purpose, whether or not consistent with the foregoing. Youthia makes no undertaking, representation or warranty in respect of its use of such funds.

18 Legal Disclaimer

Youthia is a utility token whose entire value derives from the services provided by the Youthia network in exchange for holding or consuming the tokens, as detailed above. They are not intended for speculation and hold no claim to intellectual or other property or cash flows. They grant no right to participation in the company, and no claim in decision making over company assets or strategy. There is no promise of value or claim on revenue associated with YTH other than that derived from network usage. In short, YTH is not a security. In addition, the estimations under Value for Users are based on assumptions, and there can be no guarantee that they will be achieved. Actual results may vary substantially.

The purpose of this Whitepaper is to present Youthia to potential token holders in connection with the proposed Token Sale. The information set forth below may not be exhaustive and does not imply any elements of a contractual relationship. Its sole purpose is to provide relevant and reasonable information to potential token holders for them to determine whether to undertake a thorough analysis of Youthia with the intent of purchasing YTH tokens. Nothing in this Whitepaper shall be deemed to constitute a prospectus of any sort or a solicitation for investment, nor does it in any way pertain to an offering or a solicitation of an offer to buy any securities in any jurisdiction. This document is not composed in accordance with and is not subject to, laws or regulations of any court, which are designed to protect participants.

Any interest in purchasing YTH tokens should be strictly and solely for use in connection with the token's utility, as described in this Whitepaper, and not for any other purposes, including, but not limited to, any investment, speculative or additional financial purposes. Certain statements, estimates, and information contained in this Whitepaper constitute forward-looking statements or information. Such forward-looking statements or information involves known and unknown risks and uncertainties, which may cause actual events or results to differ materially from the estimates or the results implied or expressed in such forward-looking statements.

Each participant is to rely solely on their knowledge, investigation, , and assessment of the matters, which are the subject of this Whitepaper, and any information, which is made available in connection with any further inquiries, and to satisfy itself as to the accuracy and completeness of such matters. The information contained in this Whitepaper is derived from data obtained from sources believed to be reliable and is given in good faith, but no warranties, guarantees or representations are made with regard to the accuracy, completeness or suitability of the information presented.

This English language Whitepaper is the primary official source of information about the Youthia Token Sale. The information contained herein may from time to time be translated into other languages or used in the course of written or verbal communication with existing and prospective buyers, stakeholders, partners, etc. In the direction of such translation or communication, some of the information contained herein may be lost, corrupted or misrepresented. The accuracy of such alternative communication cannot be guaranteed. In the event of any conflicts or inconsistencies between such translation and communication and this official English language Whitepaper, the provisions of this English language original document shall prevail.

19 Risk Factors

The acquisition of YTH tokens involves a high degree of risk, including, but not limited to the risks described below. Before acquiring tokens, it is recommended that each participant carefully weigh all the information and risks factors detailed.

- **Dependence on Mobile (or Computer) Infrastructure:**
  Youthia's dependence on functioning software applications, Ethereum and Quorum blockchain platforms, and the internet means that Youthia can offer no assurances that a system failure would not adversely affect access and utility of the Youthia network. Despite Youthia's implementation of all reasonable network security measures, technology is vulnerable to mobile or computer viruses, electronic break-ins or other disruptions of a similar nature. Vulnerabilities caused by third parties may result in interruption, delay or suspension of services.

- **Smart Contract Limitations:**

  Smart contract technology is still in its early stages of development, and its application is of experimental nature. This may carry significant operational, technological, regulatory, reputational and financial risks. Consequently, although the audit conducted by independent third party increases the level of security, reliability, and accuracy, this audit cannot serve as any form of warranty, including any expressed or implied warranty that the Youthia smart contracts is fit for purpose or that it contains no flaws, vulnerabilities or issues, which could cause technical problems or the complete loss of YTH tokens.

- **Regulation:**

  Blockchain technology, including but not limited to the issue of tokens may be a new concept in some jurisdictions, which may then apply existing rules or introduce new regulations regarding blockchain technology-based applications, and such rules may conflict with the current smart contract setup. This may result in substantial modifications of the smart contracts, including but not limited to its termination and the loss of YTH tokens.

- **Disclosure of Information:**

  Personal information received from YTH token holders, the number of tokens serviced by Youthia, rewards earned in the pool, the wallet addresses used, and any other relevant information may be disclosed to law enforcement, government officials, and other third parties when Youthia is required to disclose such information by law, subpoena, or court order. Youthia shall at no time be held responsible for such information disclosure.

- **Value of YTH Token:**

  Once purchased, the value of the YTH token may significantly fluctuate due to various reasons. Youthia does not guarantee any specific amount of the YTH token over any particular period of time. Youthia shall not be held responsible for any change in the value of YTH token. Assumptions concerning the preceding involve, among other things, judgments about the future economic, competitive and market conditions and business decisions, most of which are beyond the control of the Youthia Team and therefore difficult or impossible to accurately predict. Although the Youthia Team believes that its assumptions underlying its forward-looking statements are reasonable, any of these may prove to be inaccurate. As a result, the Youthia Team can offer no assurances that the forward-looking statements contained in this Whitepaper will prove to be accurate. In light of the significant uncertainties inherent in the forward-looking statements contained herein, the inclusion of such information may not be interpreted as a warranty on the part of Youthia or any other entity that the objectives and plans of Youthia will be successfully achieved.

  Please Note: Youthia may be subject to other risks not foreseen yet.

20 Appendix

Sketch of the Youthia Protocol
Network   at each epoch *t* in the ledger *L*:   1. for each new block: (a) check if the block is in the valid format   (b) check if all transactions are valid   (c) check if all orders are valid   (d) check if all proofs are valid   (e) check if all pledges are valid   (f) discard block, if any of the above fails

2. for each new order O introduced in t

(a) add O to the Seller Market's orderbook.

(b) if O is a bid: lock O.funds

(c) if O is an ask: lock O.space

(d) if O is a deal: run Put.AssignOrders

3. for each O in the Seller Market's orderbook:

(a) check if O has expired (or canceled):

• remove O from the orderbook

• return unspent O.funds

• free O.space from AllocTable

(b) if O is a deal, check if the expected proofs exist by running Manage.RepairOrders:

• if one missing, penalize the M's pledge collateral

• if proofs are missing for more than Δfault epochs, cancel order and re-introduce it to the market

• if the piece cannot be retrieved and reconstructed from the network, cancel order and re-fund the client

Buyer

at any time:

1. submit new sell orders via Put.AddOrders

(a) find matching orders via Put.MatchOrders

(b) send file to the matched buyer M

2. submit new retrieval orders via Get.AddOrders

(a) find matching orders via Get.MatchOrders

(b) create a payment YTH channel with M

on receiving Odeal from Buyer

1. sign Odeal

2. submit the signed Odeal to the network via Put.AddOrders

on receiving (pi) from Buyer Market M:

1. verify that (pi) is valid and it was requested

2. send a YTH payment to M

Selling Market

at any time:

1. renew expired pledges via Manage.PledgeSector

2. pledge new sell order via Manage.PledgeSector

3. submit a new buy order via Put.AddOrder

at each epoch *t*:

1. for each Oask in the orderbook:

(a) find matched orders via Put.MatchOrders

(b) start a new deal by contacting the matching client

2. for each sector pledged:

(a) generate proof of product/service via Manage.ProveSector

(b) if time to post the proof (every Δproof epochs), submit it to the network

on receiving piece p from client *C*:

1. check if the piece is of the size specified in the order Obid

2. create Odeal and sign it and send it to C

3. store the piece in a sector

4. if the sector is full, run Manage.SealSector

Buying Market

at any time:

1. gossip ask orders to the network

2. listen to bid orders from the network

on retrieval request from *C*:

1. start payment channel with *C*

2. split data in multiple parts

3. only send parts if payments are received

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